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| 09/748,212      | 12/27/2000  | Seiji Umemoto        | Q62446              | 5362             |

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EXAMINER

NGUYEN, DUNG T

ART UNIT PAPER NUMBER

2871

DATE MAILED: 03/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/748,212

Applicant(s)

UMEMOTO ET AL.

Examiner

Dung Nguyen

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on 27 December 2000.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1-9 and 11-14 is/are rejected.
- 7) ☐ Claim(s) 10 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 May 2001 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Drawings***

2. The drawings are objected to because there are no brief description of figures 4A-4G. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 14 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 14, it is confusing and unclear whether the claimed "a reflection layer" in line 3 and line 10 is the same one claimed in base claim 1; for the purpose of examination, it is assumed that the reflection layer of claims 1 and 14 are referring to the same element.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Broer et al., US Patent No. 5,808,713, in view of Ciupke et al., US Patent No. 5,461,547 and Masuda et al., US Patent No. 6,340,999.

Regarding claims 1-4, 6-9 and 11, Broer et al. disclose a liquid crystal display (LCD) device (figures 1-2) comprising:

- . a transmissive LCD panel including a liquid crystal cell (3) with optically isotropic substrates (glass substrates 15 and 17);
- . an illuminator (back light 7) disposed on one side surface of the LCD panel;
- . a polarizer (27 or 31) disposed on one side surface of the LCD cell;
- . a phase retarder (43) disposed between the LCD cell (3) and the polarizer (31);
- . an optical path changing sheet (light-directing system 33) including a repetitive structure of prismatic structure (continuous recesses 36) with a triangle shape which made a rough surface on a surface (e.g., back surface) of the optical path changing sheet;
- . a reflection layer (reflector 39 or reflective facets 34) disposed on a back side of the optical path changing sheet (33), wherein light reflected by the reflection layer is diffused so as to be made incident on the LCD cell (light ray  $b_1$ ).

Broer et al. neither disclose a refractive index difference of the optical path changing sheet and a nearest LCD substrate as well as a refractive index difference of an adhesive layer (used to bond the optical path changing sheet to the nearest LCD substrate) and the nearest LCD substrate nor angles of the prismatic structure.

Masuda et al. do disclose that a transparent film (e.g., adhesive layer) having a refractive index of 1.5 approximate to a light guide (i.e., optical path changing sheet) can be used (col. 7, second paragraph). In other words, a refractive index difference of the optical path changing sheet ( $n = 1.5$  for light guide) and a nearest LCD substrate ( $n = 1.449$  for glass) is not higher than 0.15 as well as a refractive index difference of an adhesive layer ( $n = 1.5$ ) and the nearest LCD substrate ( $n = 1.449$  for glass) is not higher than 0.2 (or 0.1 in claim 6). Therefore, it would have been obvious to one skilled in the art at the time of the invention was made to form the Broer et al. device having a substrate, an adhesive layer and an optical path changing sheet having a refractive index approximate to each other as shown by Masuda et al. in order to obtain an uniform illumination in an LCD device (col. 7, lines 22-23).

Ciupke et al. disclose an optical sheet (11) with a prismatic configuration (figures 1-2) comprising a set of continuous grooves (17), in which an optical path changing slopes (slope formed by 16) facing an illuminator (light source 18) at an inclination angle of  $35^{\circ}$ - $45^{\circ}$  with respect to a plane of the optical sheet and flat surface being inclined at an inclination angle of not larger than  $10^{\circ}$  (e.g.,  $0^{\circ}$ ) so as a project area of the flat surfaces is not smaller than 10 times as large as a project area of the optical path changing slopes (col. 2, lines 48-49). Ciupke et al. also teach, regarding claims 5 and 9, the continuous grooves (17) extended from one end of the optical sheet to the other end thereof in a ridgeline direction parallel to a side surface of an LCD

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device (12). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the Broer et al. optical path changing sheet having a prismatic structure with a prismatic configuration as shown by Ciupke et al. in order to provide an uniform illumination to an LCD device from an illuminator (col. 2, lines 8-15).

7. Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Broer et al., US Patent No. 5,808,713, in view of Ciupke et al., US Patent No. 5,461,547 and Masuda et al., US Patent No. 6,340,999, and further in view of Koretoshi, JP 11-142618.

Regarding the above claims, the modification to the Broer et al. disclose the claimed invention as described above except for the adhesive layer exhibits light diffusing characteristic and a high reflectance for the reflection layer. However, the use of a light diffusing adhesive layer is known to one skilled in the art as can be seen in the Koretoshi's light diffusing sheet (see figure 1). Therefore, it would have been obvious to one skilled in the art at the time of the invention was made to use an adhesive layer exhibiting light diffusing characteristic as shown by Koretoshi in order to improve transmitted light (see abstract). Furthermore, the use of a high reflectance material for the reflection layer is well known in the art such as aluminum (Al); thus it would have been obvious to one skilled in the art at the time of the invention was made to use an aluminum based material which is a high-reflectance characteristic for a reflection layer in order to improve a reflection effect in an LCD device.

***Allowable Subject Matter***

8. Claim 10 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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9. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 10, relevant prior art of record did not disclose, alone or in combination, an LCD device comprising a prismatic concave portions being constituted by discontinuous grooves each of which has a length of not smaller than five times as large as a depth of the groove and in which a longitudinal direction of the groove is substantially parallel to a side surface of an LCD panel on which a light source is disposed.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dung Nguyen whose telephone number is 703-305-0423. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on 703-305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7726 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

DN  
03/20/2003

*Dung Nguyen*  
*Patent Examiner*  
*GAU 2871*